AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1-33. (Cancelled)

34. (Currently Amended) A method for determining a volume of formation cut by each one of a
    plurality of roller cones on a drill bit drilling in earth formations, comprising:

    selecting bit design parameters, comprising at least a geometry of a cutting element on
        the drill bit;

    selecting an earth formation;

    calculating from the selected bit design parameters and the selected earth formation,
        parameters for a crater formed when each one of a plurality of cutting elements
        on each of the roller cones contacts the earth formation, the parameters including
        at least a volume of the crater;

    incrementally rotating the bit, and repeating the calculating of the crater parameters
        through ~~for~~ a selected ~~number of~~ incremental <u>angle of</u> rotation[[s]]; ~~and~~

    combining the volume of each crater formed by each of the cutting elements on each of
        the roller cones to determine the volume of formation cut by each of the roller
        cones<u>; and</u>

    <u>graphically displaying the formation with the volume cut by each of the roller cones.</u>

35. (Previously Presented) The method as defined in claim 34 wherein the volume of each of the
    craters is determined by:

    determining an axial force on each of the cutting elements;

    calculating, from the axial force on each of the cutting elements, an expected depth of
        penetration and projected area of contact between each of the cutting elements
        and the earth formation; and

    calculating the volume of each of the craters from the expected depth of penetration and
        projected area of contact.

36. (Previously Presented) The method as defined in claim 35 further wherein the axial force
    acting on each of the cutting elements totals an axial force applied to the drill bit.

37. (Previously Presented) The method as defined in claim 36 wherein an incremental axial movement of the drill bit corresponding to the incrementally rotating is adjusted to cause the axial force on each of the cutting elements to total the axial force applied to the drill bit, the axial force acting on each of the cutting elements determined with respect to a predetermined relationship between depth of penetration and axial force applied for the cutting element geometry and the earth formation.

38. (Previously Presented) The method as defined in claim 37 wherein the predetermined relationship is determined by laboratory experiment comprising impressing a cutting element having known geometry onto a selected earth formation, while measuring force on the cutting element and a corresponding depth of penetration of the cutting element into the selected earth formation.

39. – 44. (Cancelled)

45. (Currently Amended) A method for balancing a volume of formation cut by each one of a plurality of roller cones on a drill bit drilling in earth formations, comprising:

selecting bit design parameters, comprising at least a geometry of a cutting element on the drill bit;

selecting an earth formation; calculating from the selected bit design parameters and the selected earth formation, parameters for a crater formed when each one of a plurality of cutting elements on each of the roller cones contacts the earth formation, the parameters including at least a volume of the crater;

incrementally rotating the bit, and repeating the calculating of the crater parameters through ~~for~~ a selected ~~number of~~ incremental angle of rotation[[s]];

combining the volume of each crater formed by each of the cutting elements on each of the roller cones to determine the volume of formation cut by each of the roller cones; ~~and~~

adjusting at least one of the bit design parameters, and repeating the calculating the crater volume, incrementally rotating and combining the volume until a difference between the combined volume cut by each of the cones is less than the combined volume determined prior to the adjusting the at least one of the bit design parameters; and

graphically displaying the formation with the volume cut by each of the roller cones.

46. (Previously Presented) The method as defined in claim 45 wherein the volume of each of the craters is determined by:

determining an axial force on each of the cutting elements;

calculating, from the axial force on each of the cutting elements, an expected depth of penetration and projected area of contact between each of the cutting elements and the earth formation; and

calculating the volume of each of the craters from the expected depth of penetration and projected area of contact.

47. (Previously Presented) The method as defined in claim 46 wherein the axial force acting on each of the cutting elements totals an axial force applied to the drill bit.

48. (Previously Presented) The method as defined in claim 47 wherein an incremental axial movement of the drill bit corresponding to the incrementally rotating is adjusted to cause the axial force on each of the cutting elements to total the axial force applied to the drill bit, the axial force acting on each of the cutting elements determined with respect to a predetermined relationship between depth of penetration and axial force applied for the cutting element geometry and the earth formation.

49. (Previously Presented) The method as defined in claim 45 wherein the at least one bit design parameter comprises a number of cutting elements on at least one of the cones.

50. (Previously Presented) The method as defined in claim 45 wherein the at least one bit design parameter comprises a location of cutting elements on at least one of the cones.